

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1 – 5 (canceled).

Claim 6 (original): An amorphous carbon film, comprising:

a mixed layer on a surface of a base material, said mixed layer containing portions of the base material and at least one substance selected from the group consisting of B, Al, Ti, V, Cr, Zr, Nb, Mo, Hf, Ta, and W, said mixed layer formed with a thickness of 0.5 nm or greater 10 nm or less; and

an amorphous carbon layer formed on top of said mixed layer.

Claim 7 (original): An amorphous carbon film, comprising:

an amorphous carbon layer

an interlayer disposed between a base material and the amorphous carbon layer, said interlayer containing at least one substance selected from the group consisting of B, Al, Ti, V, Cr, Zr, Nb, Mo, Hf, Ta, and W, and said interlayer having a thickness of 0.5 nm or greater 10 nm or less;

wherein on a base material side of said interlayer, there is a mixed layer which contains portions of the base material and the interlayer material and which has a thickness of 0.5 nm or greater and 10 nm or less.

Claim 8 (original): An amorphous carbon film as described in claim 7, wherein: said mixed layer and said interlayer have a combined thickness of 10 nm or less.

Claim 9 (original): An amorphous carbon film according to any one of claims 6 to 8, wherein a thickness of said mixed layer is 0.5 nm or greater 5 nm or less.

Claim 10 (currently amended): An amorphous carbon film according to any one of claims 6 to 8, wherein an average oxygen concentration contained in said mixed layer or in said mixed layer and interlayer is 1 at% or less.

Claims 11 - 17 (canceled).

Claim 18 (new): An amorphous carbon film according to any one of claims 6-8, wherein said film having a density of 2.8 g/cm³ or greater and 3.3 g/cm³ or less.

Claim 19 (new): An amorphous carbon film according to any one of claims 6-8, said film having a spin density of 1×10^{18} spins/cm³ or greater and 1×10^{21} spins/cm³ or less.

Claim 20 (new): An amorphous carbon film according to any one of claims 6-8, wherein a concentration of carbon in the film is 99.5 at% or greater, a concentration of hydrogen in the film is 0.5 at% or less, a concentration of a rare gas element in the film is 0.5 at% or less.

Claim 21 (new): An amorphous carbon film according to any one of claims 6-8, wherein said amorphous carbon film is essentially formed from carbon.

Claim 22 (new): An amorphous carbon film according to any one of claims 6-8, wherein Knoop hardness is 3000 or greater 7000 or less.

Claim 23 (new): A method for manufacturing an amorphous carbon film according to any one of claims 6-8, comprising:

executing a sputter method or a cathode arc ion plating method or a laser ablation method; and

forming an amorphous carbon film with solid carbon as a raw material under an atmosphere which does not contain hydrogen.

Claim 24 (new): A method for manufacturing an amorphous carbon film according to any one of claims 6-8 further comprising:

executing a cathode arc ion plating method or laser ablation method, with solid carbon as raw material and under an atmosphere with a degree of vacuum of 0.05 Pa or lower; and

forming an amorphous carbon layer without introducing gas which contains hydrogen or rare gas.

Claim 25 (new): A method for manufacturing an amorphous carbon film according to claim

23, further comprising:

synthesizing said mixed layer by applying a negative bias voltage on said base material and using an ion injection method, plasma CVD method, sputter method, cathode arc ion plating method, or laser ablation method.

Claim 26 (new): A method for manufacturing an amorphous carbon film according to claim 23, further comprising:

synthesizing said mixed layer by applying a negative bias voltage on said base material and using an ion injection method, plasma CVD method, sputter method, cathode arc ion plating method, or laser ablation method under an atmosphere which contains rare gas.

Claim 27 (new): An amorphous carbon film coated material, comprising:
a material being coated with an amorphous carbon film according to any one of claims 6-8.

Claim 28 (new): An amorphous carbon film coated material, comprising:
a material being coated with an amorphous carbon film manufactured by a method according to claim 23.

Claim 29 (new): A method for manufacturing an amorphous carbon film according to claim 24, further comprising:

synthesizing said mixed layer by applying a negative bias voltage on said base material and using an ion injection method, plasma CVD method, sputter method, cathode arc ion plating

method, or laser ablation method.

Claim 30 (new): A method for manufacturing an amorphous carbon film according to claim 24, further comprising:

synthesizing said mixed layer by applying a negative bias voltage on said base material and using an ion injection method, plasma CVD method, sputter method, cathode arc ion plating method, or laser ablation method under an atmosphere which contains rare gas.

Claim 31 (new): An amorphous carbon film coated material, comprising:

a material being coated with an amorphous carbon film manufactured by a method according to claim 24.

Claim 32 (new): An amorphous carbon film coated material, comprising:

a material being coated with an amorphous carbon film manufactured by a method according to claim 25.

Claim 33 (new): An amorphous carbon film coated material, comprising:

a material being coated with an amorphous carbon film manufactured by a method according to claim 26.

Claim 34 (new): An amorphous carbon film coated material, comprising:

a material being coated with an amorphous carbon film manufactured by a method according to claim 27.

Claim 35 (new): An amorphous carbon film coated material, comprising:
a material being coated with an amorphous carbon film manufactured by a method according
to claim 28.